REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

I. Introduction

Claims 1-26, 33-39 and 43-60 are pending in this application. Claims 37 and 38 are amended. No claims are cancelled or added. No new matter is added. Claims 6-10, 33, 38, 39, 41, 43, 44, 45, 48, 51, 52 and 54-60 are withdrawn from consideration. Applicants respectfully request that withdrawn dependent claims be rejoined upon allowance of the independent claim from which they depend.

II. The Rejections Should Be Withdrawn

Claims 1-5, 11-13, 15, 17-26, 34, 35, 37, 40, 42, 43, 46, 47, 50 and 53 are rejected under § 103(a) as being obvious over Altmann in view of Thundat. This rejection is respectfully traversed.

A. Claims 1, 37 and 53

Claims 1 and 53 recite a detector or means for measuring a damping of resonance motion of the resonator in response to a molecular binding event on the resonator, respectively. Claim 37 has been amended to recite a detector for measuring a damping of resonance motion of the resonator in response to a molecular binding between the at least one first resonator and the substrate or the second mechanical resonator. Neither Altmann nor Thundat teach these limitations.

Altmann does not teach or suggest measuring damping of resonance motion. The Office Action states that col. 17, lines 32-36 of Altmann teaches that "the interactions between the cantilever and the sample lead to a dependency of the oscillating amplitude,

which can be evaluated to obtain information about the interaction". However, this is not a teaching to measure damping of resonance motion. As noted in the response filed June 9, 2005, measurement of damping of resonance motion involves measurement of the <u>decay</u> of the vibration amplitude versus time. There is no disclosure in Altmann to measure the <u>decay</u> of the vibration amplitude versus time. Thus, Altmann does not teach or suggest measuring damping of resonance motion.

Furthermore, Altmann does not teach measuring a damping of resonance motion of the resonator <u>in response to a molecular binding event on the resonator or between the resonator and a substrate</u>, as recited in claims 1, 37 and 53 of the present application. Altmann teaches two separate methods in Column 17. Neither of these methods teach measuring a damping of resonance motion of the resonator <u>in response to a molecular binding event on the resonator.</u>

The first method is described in col. 17, lines 15-28 and illustrated in Figure 4b of Altmann, involves the use of a biofunctionalized cantilever to perform intra-molecular force spectroscopy measurements. As shown in Figure 4b, the biofunctionalized cantilever is brought near a biofunctionalized surface. The cantilever is then retreated from the surface to stretch biomolecules between the surface and the cantilever. The tension forces acting on the cantilever are then recorded.

However, in this method, the cantilever is not oscillated at a certain frequency. This is clearly shown in Figure 4b of Altmann. Therefore, since the cantilever is not being osciallated at a certain frequency, it is impossible to measure the damping of resonance motion in this method.

The second method is described in col. 17, lines 29-38 and illustrated in Figure 4c. In this method, the cantilever is oscillated at a given frequency to obtain information about the interaction between the cantilever and the substrate. This is a typical atomic force microscopy (AFM) method in which a scanned, oscillating cantilever AFM probe is used to image a surface of the substrate.

However, in this method, there is no molecular binding event between the cantilever and a biomolecule. In other words, the distance between the cantilever and the substrate is measured. The cantilever is not biofunctionalized and there are no molecular binding events on the cantilever that are being measured. Thus, the method of Figure 4c of Altmann also does not provide measurement of damping motion <u>in response to a molecular binding event on the resonator</u> because there is no molecular binding event on the cantilever.

In summary, Altmann teaches two separate and distinct measurement methods. In the method of Figure 4b, the cantilever is biofunctionalized but is not oscillated. Thus, damping of resonance motion is not measured. In the method of Figure 4c, the cantilever is oscillated but not biofunctionalized. There are no molecular binding events on the cantilever and damping of resonance motion due to the molecular binding events are also not measured. There is no motivation in Altmann to somehow combine these two different methods.

Thus, Altmann does not teach or suggest detector or means for measuring a damping of resonance motion of the resonator in response to a molecular binding event on the resonator, as recited in claims 1 and 53, respectively. Altmann also does not teach or suggest a detector for measuring a damping of resonance motion of the resonator in response to a molecular binding between the at least one first resonator and the substrate or the second mechanical resonator, as recited in claim 37.

Thundat was relied upon merely for the teaching of the size of the cantilever. As noted in the response filed June 9, 2005, Thundat also does not teach or suggest measuring damping of resonance motion. Therefore, even if there was motivation to combine Altmann and Thundat, the combination would not teach or suggest all elements of claims 1, 37 and 53 because neither Altmann nor Thundat teach measuring a damping of resonance motion of the resonator in response to a molecular binding event on the resonator.

B. Claim 47

Claim 47 recites "a substrate or a second mechanical resonator which is disposed within the reservoir, wherein the substrate or the second resonator is biofunctionalized with a second receptor or a second ligand, and <u>wherein the first receptor or ligand and the second</u>

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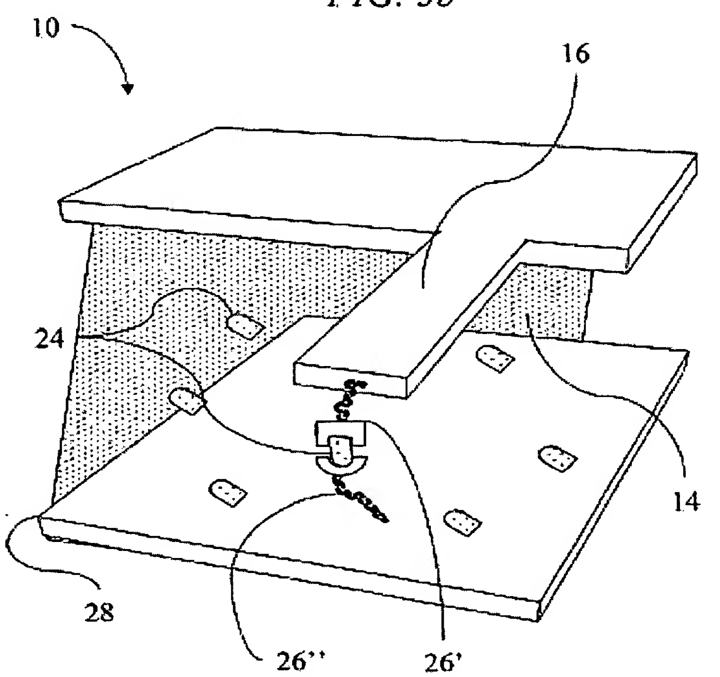
receptor or ligand are capable of binding to a third receptor or a third ligand in a solution such that the third receptor or ligand binds to both the first receptor or ligand and to the second receptor or ligand at a same time." In other words, claim 47 recites that the cantilever(s) and/or the substrate are biofunctionalized with receptor or ligand which binds to a third receptor or ligand other than the receptors or ligands that coat the cantilever(s) and/or the substrate. Thus, the receptors or ligands on the cantilever(s) and/or the substrate do not bind to each other, but instead bind to some other third receptor or ligand.

A non-limiting example of this configuration is illustrated in Figure 3B of the present application, in which the third ligand 24 binds to the receptor 26' on the cantilever and to the receptor 26" on the substrate. This third ligand 24 binds to the receptors 26' and 26" to cause the cantilever 16 to become bound to the substrate 28. However, the third ligand is not directly bound to cantilever 14 or to the substrate 28.

Figure 3B of the present application is reproduced below:

FIG. 3b



In contrast, Altmann teaches a cantilever which is biofunctionalized with a receptor which binds directly to the ligand on the substrate (i.e., a ligand-receptor pair), as noted in col. 16, lines 19-22. Altmann does not teach or suggest biofunctionalizing the cantilever with a receptors which binds to a separate third ligand from the ligand on the substrate. In other words, with reference to Figure 3B above, the device of Altmann would have a receptor 26' bound directly to a ligand 26", but would lack the ligand 24 which is not bound to either the substrate or the cantilever.

Thundat does not teach or suggest the limitations of claim 47 and does not cure the deficiencies of Altmann. Applicants respectfully request that the rejection be withdrawn.

C. Dependent Claims

Dependent claims 14, 16, 36 and 49 are rejected under § 103(a) as being obvious over Altmann in view of Thundat and further in view of various tertiary references. This rejection is respectfully traversed. Applicants respectfully submit that these tertiary references were applied only against the dependent claims and do not cure the deficiencies of Altmann and Thundat with respect to the independent claims.

III. Conclusion

Applicants submit that the application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 12/13/06 By [signature]

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